

Claims

1. A device for connecting at least one first (1) and at least one second (2) object in a vacuum chamber (3) whose size is determined by the dimensions of the objects (1, 2) so that the vacuum chamber (3) may rapidly be evacuated.
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2. The device according to claim 1 for connecting two disc-shaped objects (1 and 2) having plane-parallel surfaces in a vacuum chamber (3) that is formed by an object holder or table (5) for carrying the second object (2) and a lid (4, 6) that is sealingly placeable onto the object holder or table (5) and on whose inner side, opposite the
10 object holder or table (5), the first object (1) may be mounted in parallel to the second object (2) and comprising means for approaching the two parallel objects, while the vacuum chamber (3) is closed, during and/or after the evacuation of the vacuum chamber.
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3. The device according to claim 2, wherein the lid (4, 6) comprises a vacuum chamber ring (6) and a mounting (4) for the first object (1) and the mounting (4) is vertically shiftable with respect to the vacuum chamber ring (6).
- 20 4. The device according to claim 2 or 3, wherein the mounting (4) comprises a vacuum holding means (7) for holding the first object (1) and the vacuum chamber ring (6) comprises an opening (8) for evacuating and aerating the vacuum chamber (3).
- 25 5. The device according to claim 3 or 4, wherein the vacuum chamber (3) is movably sealed off against the mounting (4) by the vacuum chamber ring (6) via a first seal ring (9) and may be sealed off against the table (5) by means of a second seal ring (10).
- 30 6. The device according to any of claims 3 to 5, wherein the vacuum chamber ring (6) is placeable onto table (5) by lowering the lid (4, 6) so as to form the vacuum chamber (3) together with the mounting (4) and the table (5) and the vacuum chamber ring (6) is liftable by raising the lid (4, 6) from the table (5).
- 35 7. The device according to any of claims 2 to 6, wherein a protective film (11) is provided between the mounting (4) and the first object (1).

8. The device according to any of claims 1 to 7, wherein an adhesive or an adhesive film is provided on at least one of the objects (1, 2) for establishing the connection.
- 5 9. The device according to claims 1 to 8, wherein in the not-evacuated state there is a distance (d) between the first object (1) and the second object (2).
- 10 10. The device according to claim 9, wherein the distance (d) is in the range of 1 to 5 mm.
- 10 11. The device according to any of claims 1 to 10, wherein in the evacuated state the first object (1) is pressed onto the second object (2) by the atmospheric pressure.
12. The device according to claim 11, wherein the mounting (4) is additionally moveable in the pressing direction (A) in a controlled manner.
- 15 13. The device according to any of claims 5 to 12, wherein a spring-supported holding-down ring is provided so as to fix the vacuum chamber ring (6) on the table (5).
14. The device according to any of claims 2 to 13, wherein the mounting (4) is provided for a plurality of first objects and the table (5) for a plurality of second objects.
- 20 15. The device according to any of claims 1 to 14, wherein the first object (1) is a semiconductor substrate and the second object (2) is a carrier.
- 25 16. The method for connecting at least one first (1) and at least one second (2) object, wherein the vacuum is generated in an area whose size is determined by the dimensions of the objects (1, 2) so that the vacuum is rapidly generated.
17. The method according to claim 16, wherein the objects (1, 2) are pressed together by the atmospheric pressure and connected by means of an adhesive and an adhesive film.
- 30 18. The method according to claim 17, wherein the objects (1, 2) are additionally pressed together by means of pressing means in a controlled manner.
- 35 19. The method according to any of claims 16 to 18, wherein a plurality of first (1) and a plurality of second (2) objects are connected in one step.

20. The method according to claims 16 to 19, wherein the first object (1) is a semiconductor substrate and the second object (2) is a carrier.

5 21. The method according to claims 17 and 20 using the device according to claim 11 and comprising the following steps:

(a) arranging the lid (4, 6) with the mounting (4) with the first object (1) and the vacuum chamber ring (6) opposite the second object (2) on the table (5);

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(b) lowering the lid (4, 6) onto the table (5) until the vacuum chamber ring (6) rests on the table (5), wherein a distance (d) is adjusted between the first and the second object (1, 2);

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(c) evacuating the vacuum chamber (3);

(d) lowering the mounting (4) with the first object (1) by means of the atmospheric pressure with respect to the vacuum chamber ring (6) simultaneously or with a delay onto the first object;

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(e) pressing the first object (1) onto the second object (2) by means of the atmospheric pressure and gluing together the objects (1, 2);

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(f) aerating the vacuum chamber (3) and releasing the first object (1) from the mounting (4); and

(g) lifting the lid (4, 6) from the joined objects (1, 2).

30 22. The method according to claim 21, wherein in step (e) the first object (1) is additionally pressed onto the second object (2) in a controlled manner.